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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,678	12/22/2000	Klaus Kehrle	20001670-4	4640

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EXAMINER	
YANG, RYAN R	
ART UNIT	**PAPER NUMBER**
2628	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/747,678	KEHRLE ET AL.	
	Examiner	Art Unit	
	Ryan R. Yang	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the Appeal Brief filed on 6/28/2006, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

2. Claims 11-28 are pending in this application. Claims 11, 21 and 26 are independent claims. This application claims foreign priority dated 12/24/1999.

3. The present title of the invention is "Method for interactive construction of virtual 3D circuit models"" as filed originally.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The invention is about object manipulation in mechanical CAD, which has nothing to do with "circuit".

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.

6 Claims 11-15, 21-24 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukouchi et al. (6,104,403).

As per claim 11, Mukouchi et al., hereinafter Mukouchi discloses a method of manipulating computer aided design (CAD) objects, comprising:

receiving user input to associate two CAD objects, wherein said user input identifies a coupling between said two CAD objects selected from a group of connections consisting of: a vertex-to-vertex connection, an axis-to-axis connection, an

edge-to-axis connection, and a face-to-face connection (Figure 21 where 114 is a door and 112 is a door frame; the connection between the two is an edge-to-edge connection);

displaying said two CAD objects according to the coupling identified by the user input (Figure 22 where the hinge unit of the door frame model with the reference points 116 and 118 are identified as the coupling);

calculating a reduction in degrees of freedom between said two CAD objects caused by said identified coupling calculating and providing on the screen an indication of a remaining degrees of freedom of the components after the change has been made (Figure 19 depicts the calculation steps; Figure 24 is an explanatory diagram of the degree of freedom between assembling part models having two points junction reference data", column 6, line 11-13; "FIG. 24 illustrates an assembly model appearing after attaching the door part model 114 to the door frame part model 112 at the two junction reference points", column 15, line 33-35. Since the door is hinged after movements, it shows lesser degree of freedom of movement. Since Mukouchi teaches the movement of the model (Figure 19- S1-S7), and the movement shows the degree of freedom (Figure 22 and 24 which shows that after the reference points 116 and 118 are hinged, the movement of the door is restricted to an angular movement and no other possible movement is indicated), it is inherent that Mukouchi is calculating for the movement of the object and the degree of freedom); and

displaying an indication of said reduction in said degrees of freedom in association with the display of said two CAD objects (Figure 24 displays reduction of

freedom after connection where the arrow and dash lines are the indications showing the restricted movement after the edges are connected).

Mukouchi teaches assembling 3D object model. It is noted that Mukouchi does not explicitly mention his Figure 24 is used for a CAD system. However, since Mukouchi teaches his objects are created using CAD technique (Figure 7, line 52), it would have been obvious to one of ordinary skill in the art to apply it to a CAD system in order to exemplify a possible movement of an object.

7. As per claim 12, Mukouchi demonstrated all the elements as disclosed in the rejected claim 11, and further discloses at least one of said two CAD objects comprises a group of subcomponents (Figure 50 where each CAD object is a complex object with a pluralities of sub-components).

8. As per claim 13, Mukouchi demonstrated all the elements as disclosed in the rejected claim 11, and further discloses:

verifying that said identified coupling is consistent with a prior coupling between said two CAD objects before performing said displaying said two CAD objects ("In case of the mode 2 assembling process, as in Fig. 15 for instance, the movements of the assembling part models are **checked** in the state where the basic part model 64 which is the assembling object and the part models 66 and 68 to be assembled are arranged in the world coordinate space", column 14, line 41- column 15, line 9, where checking the state is a verifying process).

9. As per claim 14, Mukouchi demonstrated all the elements as disclosed in the rejected claim 11, and further discloses:

receiving user input to position said two CAD objects relative to each other before receiving said user input that identifies a coupling between said two CAD objects ("Figure 10A and 10B illustrate another embodiment of processing for assembling together part models having one point junction reference data. Fig. 10A shows the preassembling state in which the part models 30 and 46 are arranged in the world coordinate space, with the part models 30 and 46 having junction reference points 32 and 48 set in there respective intra-model units ...", column 11, line 51-64); and

displaying said two CAD objects according to relative positioning (Figure 10B).

10. As per claim 15, Mukouchi demonstrated all the elements as disclosed in the rejected claim 14, and further discloses:

calculating a reduction in degrees of freedom caused by said relative positioning of said two CAD objects (Figure 19 depicts the calculation steps; Figure 24 is an explanatory diagram of the degree of freedom between assembling part models having two points junction reference data", column 6, line 11-13; "FIG. 24 illustrates an assembly model appearing after attaching the door part model 114 to the door frame part model 112 at the two junction reference points", column 15, line 33-35. Since the door is hinged after movements, it shows lesser degree of freedom of movement. Before the door is hinged, the door is moveable in both lateral and angular direction; afterward, the door is moveable only in angular direction, therefore, it is lesser degree of freedom); and

displaying said reduction in degrees of freedom in association with display of said two CAD objects (displaying an indication of said reduction in said degrees of freedom

in association with the display of said two CAD objects (Figure 24 displays reduction of freedom after connection).

11. As per claim 21, Mukouchi discloses a computer aided design (CAD) system, comprising:

means for defining a virtual environment in which CAD objects are manipulated (Figure 1 is the means and Figure 21 is a virtual environment);

and since the rest of the limitations are similar to claim 11, they are similarly rejected as in claim 11.

12. As per claim 22, since the claim limitation is similar to claim 12, it is similarly rejected as claim 12.

13. As claim 23, since the claim limitation is similar to claim 13, it is similarly rejected as claim 13.

14. As claim 24, since the claim limitation is similar to claim 14, it is similarly rejected as claim 14.

15. As per claim 26, Mukouchi discloses a method, comprising:

providing a virtual environment in which computer aided design (CAD) objects are manipulated (Figure 21 is a virtual environment);

and since the rest of the limitations are similar to claim 11, they are similarly rejected as in claim 11.

16. As per claim 27, since the claim limitation is similar to claim 12, it is similarly rejected as claim 12.

17. As per 28, since the claim limitation is similar to claim 13, it is similarly rejected as claim 13.

18. Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukouchi et al. as applied to claim 11 above, and further in view of Bentley et al. (6,341,291).

19. As per claim 16, Mukouchi demonstrated all the elements as disclosed in the rejected claim 11.

Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model. It is noted that Mukouchi does not explicitly disclose "said receiving, displaying said two CAD objects, calculating, and displaying an indication are performed by a collaborative design application associated with a plurality of users", however, this is known in the art as taught by Bentley. Bentley discloses a computer network used in CAD design where a central server is used ("A plurality of client computers are bi-directionally connected to the server", Abstract, line 8-9; see also title "System for **collaborative** engineering using component and file-oriented tools").

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bentley into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Bentley discloses the CAD data be shared in a network environment in order to be used by a plurality of users.

20. As per claim 17, Mukouchi and Bentley demonstrated all the elements as disclosed in the rejected claim 16, and Bentley further discloses maintains a virtual model including said two CAD objects, and wherein said displaying said two CAD objects and displaying said indication are performed by communicating only changes in said virtual model caused by said identified coupling ("Each client computer may obtain the current version of the components and may send locally edited versions of the components back to the server to replace the current versions in the repository", Abstract line 9-13, where the locally edited version is considered a portion of the original image).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bentley into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Bentley discloses the CAD data be shared in a network environment in order to be used by a plurality of users.

21. As per claim 18, Mukouchi and Bentley demonstrated all the elements as disclosed in the rejected claim 16, and Bentley further discloses:

locking one of said two CAD objects in response to user input from a respective user, prior to receiving user input to associate two CAD objects, to prevent other users from manipulating said locked CAD object ("If there are unresolved conflicts, that is, components that have been modified and committed by another user and have also been changed locally, then commit is blocked", column 13, line 8-11, where blocked commit is considered locking ... to prevent).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Bentley into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Bentley discloses usage by other user can be blocked in order to avoid conflict.

22. As per claim 19, Mukouchi and Bentley demonstrated all the elements as disclosed in the rejected claim 16.

As for unlocking said one of said two CAD objects after displaying said two CAD objects according to the identified coupling, since the lock signal is established to prevent changes by other, it is obvious the lock signal is removed after change has been made in order to prevent hanging of the system.

23. Claims 20 and 25 rejected under 35 U.S.C. 103(a) as being unpatentable over Mukouchi as applied to claim 11 above, and further in view of Noyama (5,594,850).

24. As per claim 20, Mukouchi demonstrated all the elements as disclosed in the rejected claim 11.

Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model. It is noted that Mukouchi does not explicitly disclose wherein said displaying said two CAD objects comprises: applying a transformation matrix to at least one of said two CAD objects, however, this is known in the art as taught by Noyama et al., hereafter Noyama. Noyama discloses a method of simulating images in which a transformation matrix is calculated between a source image and a destination image (204-208 of Figure 11).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Noyama into Mukouchi because Mukouchi discloses a method of changing the relative position and/or orientation of two components of a virtual model and Noyama discloses a transformation matrix between two images can be calculated in order to facilitate the transformation.

25. As claim 25, since the claim limitation is similar to claim 20, it is similarly rejected as claim 20.

Response to Arguments

26. Applicant's arguments with respect to claims 11-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan R. Yang whose telephone number is (571) 272-7666. The examiner can normally be reached on M-F 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

28. To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Ryan Yang
Primary Examiner
September 15, 2006

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER